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PAQUIREA, A NEW ANDEAN GENUS FOR *CHUCOA LANCEOLATA* (ASTERACEAE, MUTISIOIDEAE, ONOSERIDEAE)

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ABSTRACT

A previous molecular study showed that *Chucoa ilicifolia*, the type species of the genus *Chucoa*, is within the genus *Onoseris* clade. A new genus, **Paquirea** Panero & S.E. Freire, is proposed and described to accommodate the other species of *Chucoa*, *C. lanceolata*, as **Paquirea lanceolata** (H. Beltrán & Ferreyra) Panero & S.E. Freire, comb. nov. The new genus differs from *Onoseris* in having actinomorphic corollas with lobes of equivalent size and discoid capitula. *Paquirea* shares with other Onoserideae a shrubby habit, solitary capitula, epaleate receptacles, five-lobed corollas, anthers with long tails, style branches dorsally papillose with rounded apices, and heteromorphic pappi in three series. Among the Onoserideae, *Paquirea*, because of its solitary capitula and shrubby habit, is most similar to *Plazia* and *Aphyllocladus*. *Paquirea* can be distinguished from these genera by its conspicuously leafy stems (vs. leaves soon deciduous in *Aphyllocladus*), alternate leaves (vs. spirally-arranged leaves in *Plazia*), discoid capitula (vs. radiate capitula in *Plazia*), cream-colored corollas (vs. lilac to purple corollas in *Aphyllocladus* and white to pink in *Plazia*), and glabrous achenes (vs. long-pilose achenes in *Aphyllocladus*). A key and a comparative table to the seven genera of Onoserideae are also provided.

KEY WORDS: Compositae, *Gochnatia*, Taxonomy, Peru, Arequipa

The genus *Chucoa* was established by Cabrera (1955) based on the Peruvian species *Chucoa ilicifolia*. He characterized *Chucoa* as having isomorphic florets with cream-colored five-lobed corollas, acute not apiculate apical anther appendages, and dorsally papillose style branches. Cabrera considered *Chucoa* to be closely related to *Gochnatia* and *Stifftia* and consequently placed the new genus in tribe Mutisieae Cass., subtribe Gochnatiinae Benth. & Hook. f. (Cabrera 1977).

Sancho et al. (2005) transferred the Peruvian species *Gochnatia lanceolata* described by Beltrán & Ferreyra (2001) to *Chucoa*. According to Sancho et al. (2005), *Chucoa lanceolata* (H. Beltrán & Ferreyra) G. Sancho, S.E. Freire & Katinas shared with *Chucoa ilicifolia* Cabrera isomorphic florets with cream-colored five-lobed corollas, not apiculate apical anther appendages, and dorsally papillose style branches. However, a molecular phylogenetic study found that *Chucoa ilicifolia* is within the *Onoseris* Willd. clade and therefore the species was transferred to *Onoseris* as *O. ilicifolia* (Cabrera) Panero (Panero 2009).

Onoseris is one of six genera of tribe Onoserideae, one of three tribes of subfamily Mutisioideae (Panero & Funk 2008). The other five genera of Onoserideae, *Aphyllocladus* Wedd., *Gypothamnium* Phil., *Lycoseris* Cass., *Plazia* Ruiz & Pav., and *Urmenetea* Phil. (Panero & Funk 2007), are mostly endemic to South America and only *Onoseris* and *Lycoseris* have a few species in Central America and Mexico. Onoserideae is characterized by having species with heteromorphic pappi and usually radiate capitula and can be separated from other Mutisioideae in tribes Mutisieae and Nassauvieae using habit, pappus and style branch characteristics (Roque & Funk 2013). *Chucoa lanceolata*, an endemic plant of southern Peru, has a combination of morphological features not shared by any other genus of tribe Onoserideae, i.e. isomorphic florets, cream deeply 5-lobed corollas, and obtuse apical anther appendages. We propose the transfer of *Chucoa lanceolata* to a new genus of Onoserideae, *Paquirea*.

PAQUIREA Panero & S.E. Freire, **gen. nov.** **TYPE**: *Paquirea lanceolata* (H. Beltrán & Ferreyra) Panero & S.E. Freire.

Similar to *Plazia* in having a shrubby habit, deeply five-lobed corollas, anther appendages obtuse not apiculate, glabrous achenes, and solitary capitula. Distinct from *Plazia* in having discoid capitula and white or cream-colored anther appendages, and leaves not spirally arranged on distal ends of stems.

Branched shrubs, glabrous in old stem. **Leaves** alternate, simple, sessile or subsessile; blades coriaceous, lanceolate, pinnately veined, margins denticulate, subglabrous on both surfaces. **Capitula** solitary, terminal, homogamous, discoid, shortly pedunculate; involucre campanulate, phyllaries in 4–5 series, imbricate, gradate, coriaceous; receptacles epaleate. **Florets** ca. 50, isomorphic, hermaphrodite, corollas cream, deeply 5-lobed, lobes coiled, shortly papillose at the apices; anthers 5, sagittate, tails long, pilose, apical appendages obtuse; style branches dorsally papillose on distal surface. **Achenes** cylindric, 5-costate, glabrous or sparsely glandulose; pappus bristles in 3 series, setae barbellate of unequal length, the innermost somewhat broadened proximally. **Pollen** tricolporate, prolate, exine scabrate-slightly microechinate.

The generic epithet is an anagram of Arequipa, a department in southern Peru where the plant is found.

PAQUIREA LANCEOLATA (H. Beltrán & Ferreyra) Panero & S.E. Freire, **comb. nov.** *Gochnatia lanceolata* H. Beltrán & Ferreyra, Compositae Newsl. 36: 26. 2001. *Chucoa lanceolata* (H. Beltrán & Ferreyra) G. Sancho, S.E. Freire & Katinas, Taxon 54: 86. **TYPE: PERU. Arequipa**. Provincia Castilla: Andagua, 3600-3700 m, s.d., *Carolina 01* (holotype: USM!; isotype: US!). Illustration: Taxon 54: 87.

Shrubs ca. 1.8 m tall, branched; stems glabrous. **Leaves** alternate, spreading, those of the lower parts of the branches deciduous, sessile or subsessile, coriaceous, blades 4–6 × 0.6–1.3 cm, lanceolate, base attenuate, margins denticulate, apices acute, pinnately veined. **Capitula** solitary, homogamous, discoid, shortly pedunculate; involucres 1.5–2.5 × 2–2.7 cm, campanulate; phyllaries in 4-5 series, outer phyllaries ca. 7 × 3 mm, ovate, apices acute; inner phyllaries ca. 19 × 12 mm, linear-oblong, apices acute to acuminate. **Florets** ca. 50, hermaphrodite, isomorphic, corollas cream, 22–23 mm long, corollas tubulose, deeply 5-lobed, lobes 7–8 mm long, coiled, shortly papillose at apices; anthers 11–11.5 mm long, apical appendages ca. 1.3 mm; tails ca. 2 mm long, pilose; style branches 3–3.5 mm long. **Achenes** 6–8 mm long, cylindric, glabrous or with very few glandular, biseriate trichomes. **Pappus bristles** in 3 series, 12–17 mm long, barbellate, unequal in length, the innermost somewhat broadened proximally. **Pollen** tricolporate, prolate, (P × E = 68-79 x 42-44 μm) exine scabrate-slightly microechinate.

Phenology — Flowering period unknown.

Distribution and habitat — *Paquirea lanceolata* occurs on sandy slopes in Andagua, Castilla Province, Department of Arequipa, at elevations between 3600-3700 m. Only known from the type collection.

Among the recognized genera of Onoseridae, *Paquirea* shares a higher number of morphological features with *Plazia* and *Aphyllocladus* than with any other genus of the tribe. The three genera are shrubs with secretory cavities, solitary capitula, deeply five-lobed corollas, and the anthers lack apiculate appendages. The new genus can be distinguished from *Aphyllocladus* by its conspicuously leafy smooth stems, cream-colored corollas, prolate pollen, and glabrous achenes, whereas *Aphyllocladus* has leaves that are soon deciduous, striate stems, lilac to purple corollas, long-pilose achenes, and prolate to subprolate pollen. The new genus differs from *Plazia* by its discoid capitula, with isomorphic florets, cream-colored corollas, and prolate pollen. In contrast, the capitula of *Plazia* are radiate, with dimorphic florets and white to pink corollas, the leaves are spiralled, and the pollen is subprolate. With this novelty tribe Onoserideae contains seven genera (Table 1). A key to the genera of the tribe is presented below.

KEY TO THE GENERA OF TRIBE ONOSERIDEAE

1. Disc floret corollas short five-lobed, less than ⅓ the length of the corolla.

    2. Plants dioecious (capitula with only female or only male florets) ..... **Lycoseris**
    2. Plants bisexual (capitula with female and hermaphrodite florets or all hermaphrodite).

        3. Capitula radiate or discoid; marginal floret corollas, when present, purple or violet **Onoseris**
        3. Capitula radiate; marginal floret corollas white or pink..... **Urmenetea**

1. Disc floret corollas deeply five-lobed, lobes ½–⅓ the length of the corolla.

    4. Achenes glabrous.

        5. Capitula radiate; florets dimorphic; leaves spirally-arranged ..... **Plazia**
        5. Capitula discoid; florets isomorphic; leaves alternate ..... **Paquirea**

    4. Achenes pilose.

        6. Stems densely covered with leaves; leaves spirally-arranged, filiform ..... **Gypothamnium**
        6. Stems appearing leafless; leaves alternate or opposite, small, linear to obovate or minute and deltoid ..... **Aphyllocladus**

Table 1. Morphological comparison between *Paquirea* and other genera of tribe Onoserideae.

Character	*Paquirea*	*Aphyllocladus*	*Gypothamnium*	*Lycoseris*	*Onoseris*	*Plazia*	*Urmenetea*
Capitula	solitary – discoid	solitary – radiate (discoid)	solitary- radiate	solitary, corymbs or racemes – radiate	solitary or panicles – radiate (discoid)	solitary - radiate	solitary – radiate
Florets	isomorphic	dimorphic (isomorphic)	dimorphic	dimorphic	dimorphic (isomorphic)	dimophic	dimorphic
Number of florets	ca. 50	10-40	numerous	numerous	numerous	17-42	numerous
Color of florets	cream	lilac to purple	purple or pinkish-purple	orange to orange- red (yellow, violet)	ray: violet or purple; disc: yellow, reddish or purple	white to pink	white or pink
Anther apical appendage	obtuse	truncate, reddish	truncate, reddish	acute	acute	truncate, reddish	acute to apiculate
Style branches	papillose	papillose	papillose	papillose	papillose	papillose	papillose
Achenes	glabrous (sparsely glandulose)	pubescent	pubescent	glabrous	pubescent to glabrescent	glabrous	glabrous
Pappus bristles	3-seriate, barbellate– unequal in length and width	2-3-seriate, barbellate – unequal in length and width	2-4-seriate, barbellate– unequal in length and width	few-many-seriate, barbellate– equal in length and width	2-many-seriate, barbellate – unequal in length, equal or unequal in width	many-seriate, barbellate– unequal in length and width	many-seriate, barbellate– unequal in length and width
Leaves, duration	persistent	soon deciduous	persistent	persistent	persistent	persistent	Persistent
Leaves. phyllotaxis	alternate	alternate or opposite	spiralled	alternate	radical or alternate	spiralled	alternate to rosulate
Secretory cavities	present	present	—	not seen	—	present	not seen
Pollen ratio P/E	prolate	prolate to subprolate	subprolate	subprolate to prolate	subprolate to prolate	subprolate	spheroidal
Pollen size	large	large	large	medium to large	large	large	large
Exine surface	scabrate-slightly microechinate	microechinate	microechinate	microechinate	microechinate	microechinate	microechinate

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